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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LAROSE, COLIN M

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/842,048

Applicant(s)

TSAI ET AL.

Examiner

Colin M. LaRose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claim 3 is objected to because of the following informalities:

Claim 3 should depend from claim 2 rather than claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 8, 11, 15, 18, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,642,431 by Poggio et al. ("Poggio").

Regarding claim 1, Poggio discloses a method for illuminant compensation of an image including a face region comprising:

determining a surface fitting based on the face region from the image (column 9, lines 34-54 and 404, figure 4: best-fit brightness plane is determined or otherwise obtained);

generating an illuminant corrected image using the surface fitting face region for the image (column 9, lines 34-54: surface fitting is subtracted from the face image to produce illuminant corrected image); and

normalizing the image (column 9, lines 34-54 and 405, figure 4: image is normalized via histogram equalization).

Regarding claims 8, 15, and 22, Poggio expressly discloses all of the features of these claims, which directly correspond to the method recited in claim 1.

Regarding claims 4, 11, and 18, Poggio teaches subtracting the surface fitting from the image as claimed (column 9, lines 48-50).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 3, 9, 10, 16, 17, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio in view of U.S. Patent 6,148,092 by Qian.

Regarding claims 2, 9, 16, and 23-26 Poggio discloses that the image includes pixels, and the step of determining the surface fitting includes:

obtaining a window (19x19) of pixels that includes a face; and
masking out portions of the window that do not belong to the face so that the surface fitting is performed only on the face region (column 9, lines 36-44).

Poggio's rationale for masking out the background areas is that the background areas are not relevant to the face detection task.

Thus, Poggio teaches, "determining a surface fitting for the image, the surface fitting is determined using only the pixels that were determined to be part of the face region."

However, Poggio is silent to extracting the face from other regions, such as the background, by "determining for each pixel whether the pixel's color is within a predetermined set of colors; and determining the pixel to be part of the face region if it is determined that the pixel's color is within the predetermined set of colors."

Qian discloses a method for extracting a face region that comprises detecting skin tones and segmenting a face from background regions based on the detected skin tones. In particular, Qian teaches detecting a face in an image comprised of a plurality of colors pixels by:

determining for each pixel whether the pixel's color is within a predetermined set of colors (i.e. whether each pixel is within the circle in figure 3); and

determining the pixel to be part of the face region if it is determined that the pixel's color is within the predetermined set of colors (i.e. the pixels that are within the circle are assigned a "1" and all other pixels are assigned "0", as shown in figure 5). See also column 4, lines 41-60.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Poggio by Qian to achieve the claimed invention by extracting the face region according to skin tone, since Qian teaches that detecting face regions in this manner is

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advantageous because, *inter alia*, it is insensitive to changes in lighting conditions (column 2, lines 30-35).

Regarding claims 3, 10, and 17, Qian teaches determining if the pixel's color is a skin color (see abstract).

7. Claims 5, 6, 12, 13, 19, 20, 27, 28, 30, 31, 33, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio in view of U.S. Patent 4,975,970 by Zettel et al. ("Zettel").

Regarding claims 5, 12, 19, 27, 30, 33, and 36, Poggio teaches normalizing the image by histogram equalization methods, but is silent to the particular claimed features for normalization.

Zettel discloses a process (figure 4) for histogram equalization of an image, wherein an image is automatically normalized according to a user's preferences. In particular, Zettel discloses

computing the average gray level and standard deviation for a plurality of pixels in the image (31, figure 4), and

transforming the level of each pixel based on a scale factor derived from the mean and standard deviation (35, figure 4), wherein the gray levels are between a predetermined range (figure 3: $V_{\min} \dots V_{\max}$ is the predetermined range of possible pixel values).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Poggio by Zettel to achieve the claimed invention since Poggio discloses normalization of the face image via histogram equalization, and Zettel teaches that performing

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histogram equalization as claimed allows a user to specify a preference for image brightness and contrast in order to produce a visually preferred image (column 3, lines 54-60).

Regarding claims 6, 13, 20, 28, 31, and 34, Poggio discloses masking out background pixels and retaining only the pixel corresponding to the face, thereby determining whether each pixel is part of the face region (column 9, lines 35-44). This causes Zettel's histogram equalization process (including the mean and standard deviation computations) to be performed on only pixels that comprise the face region.

8. Claims 7, 14, 21, 29, 32, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio in view of Zettel, and further in view of Qian.

Regarding claims 7, 14, 21, 29, 32, and 35, Poggio does not disclose determining pixels to be part of the face region based on the pixel being within a predetermined set of colors. However, this limitation would have been obvious in view of Qian, as established above for claims 2, 9, and 16.

Conclusion


9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,445,812 by Lai et al. discloses a similar illumination compensation system in the context of industrial inspection

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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Group Art Unit 2623

22 April 2004